

Sampling for Soil Nutrients

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Western Ag Innovations



WESTERN AG
INNOVATIONS

Objectives for Soil Sampling

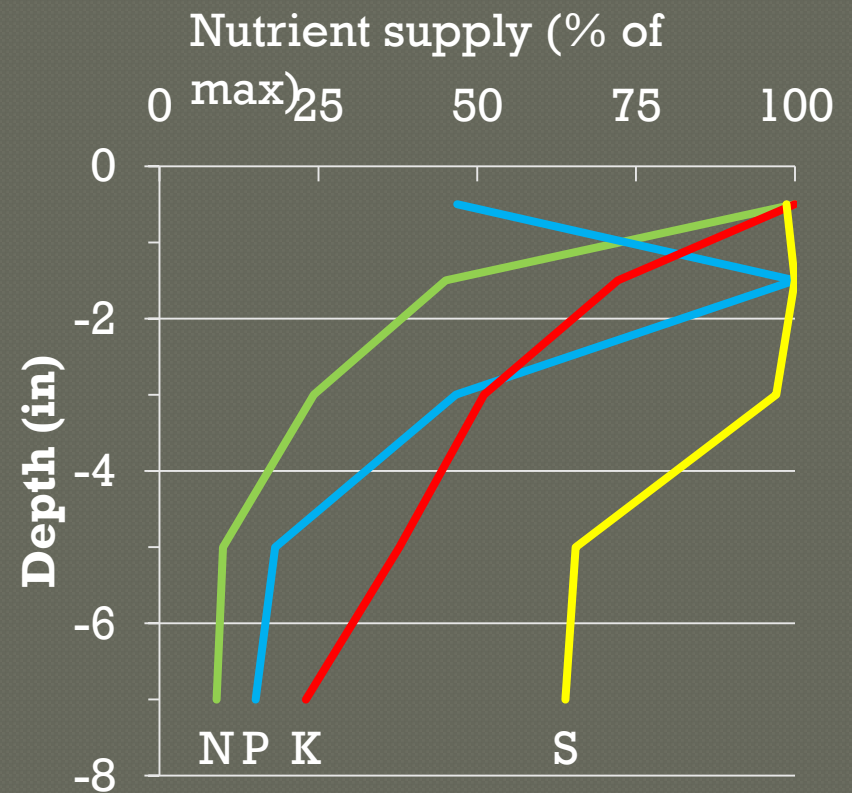
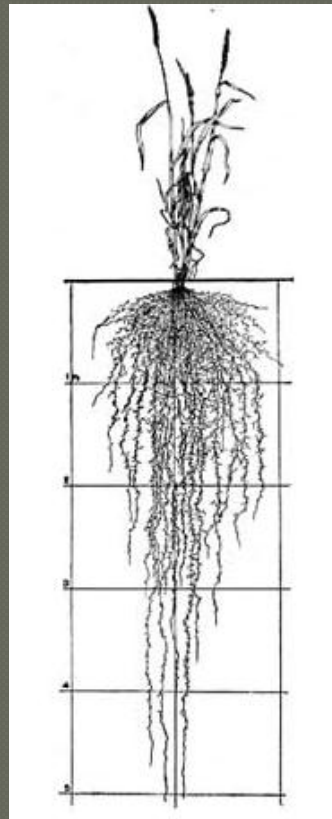
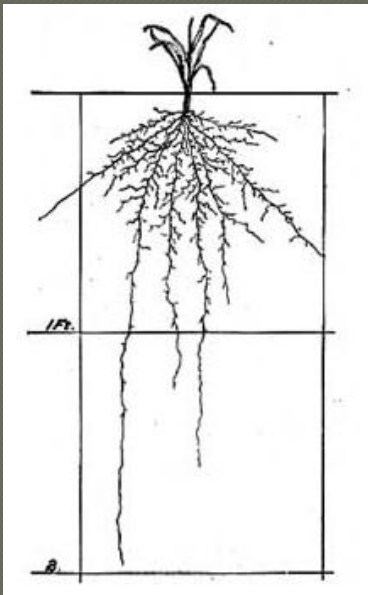
1. Optimize fertilizer return
2. Optimize manure value
3. Avoid over-application of nutrients
4. Monitor change with time

Ideal Soil Sample

- Representative
- Interpretable
- Economic

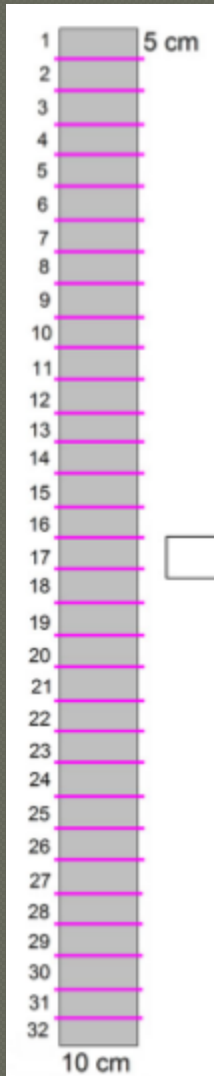
Value of improved decision > Cost of sample

Representative of What?

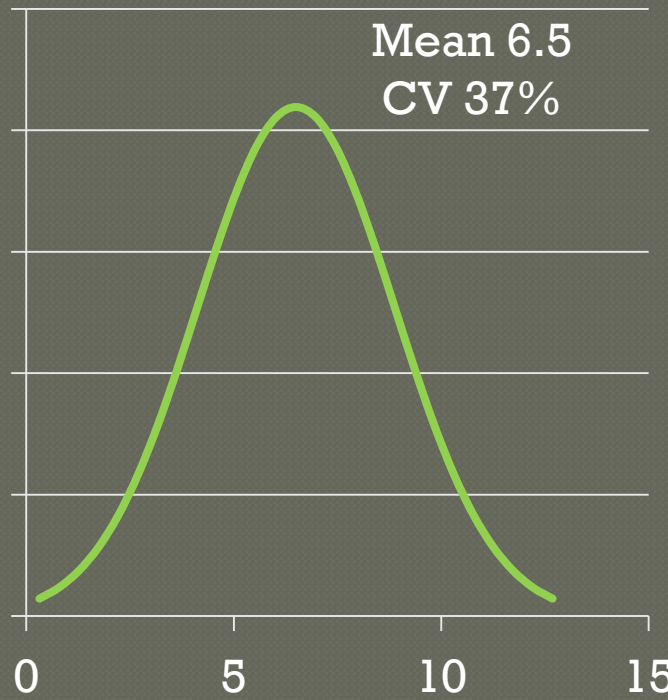


How Variable? Micro-Scale

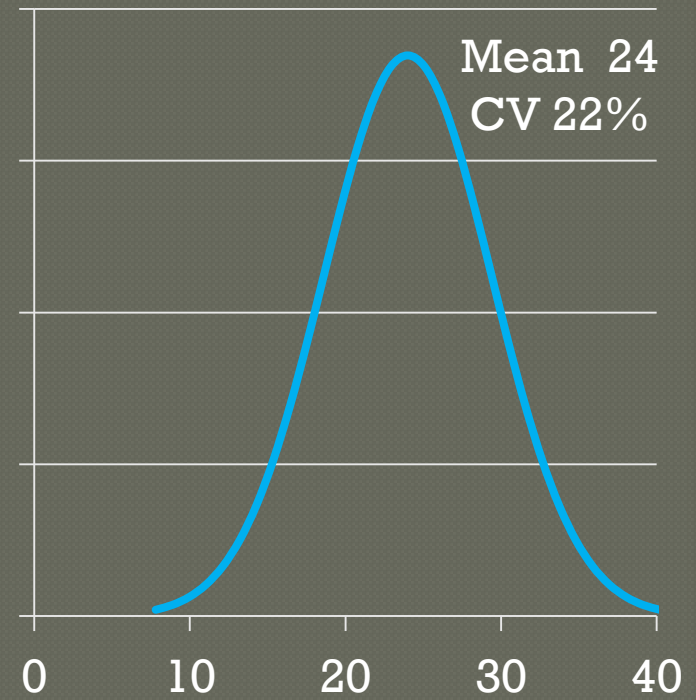
Wei Hu, Jeff Schoenau, Bing Si, 2014



NO₃-N



STP



Extractable nutrient concentration to 4 in (ppm)



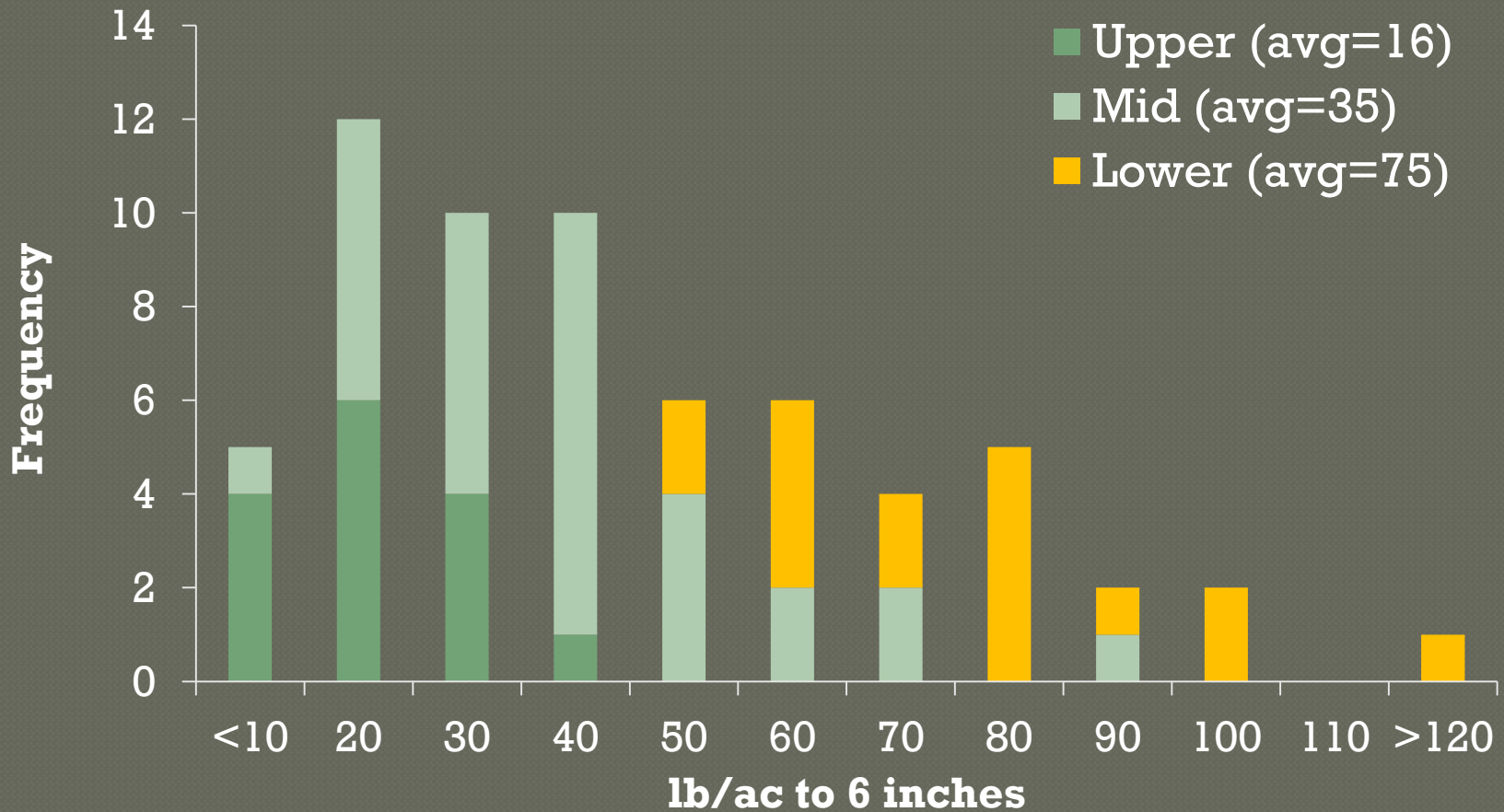
How Variable? Macro-Scale



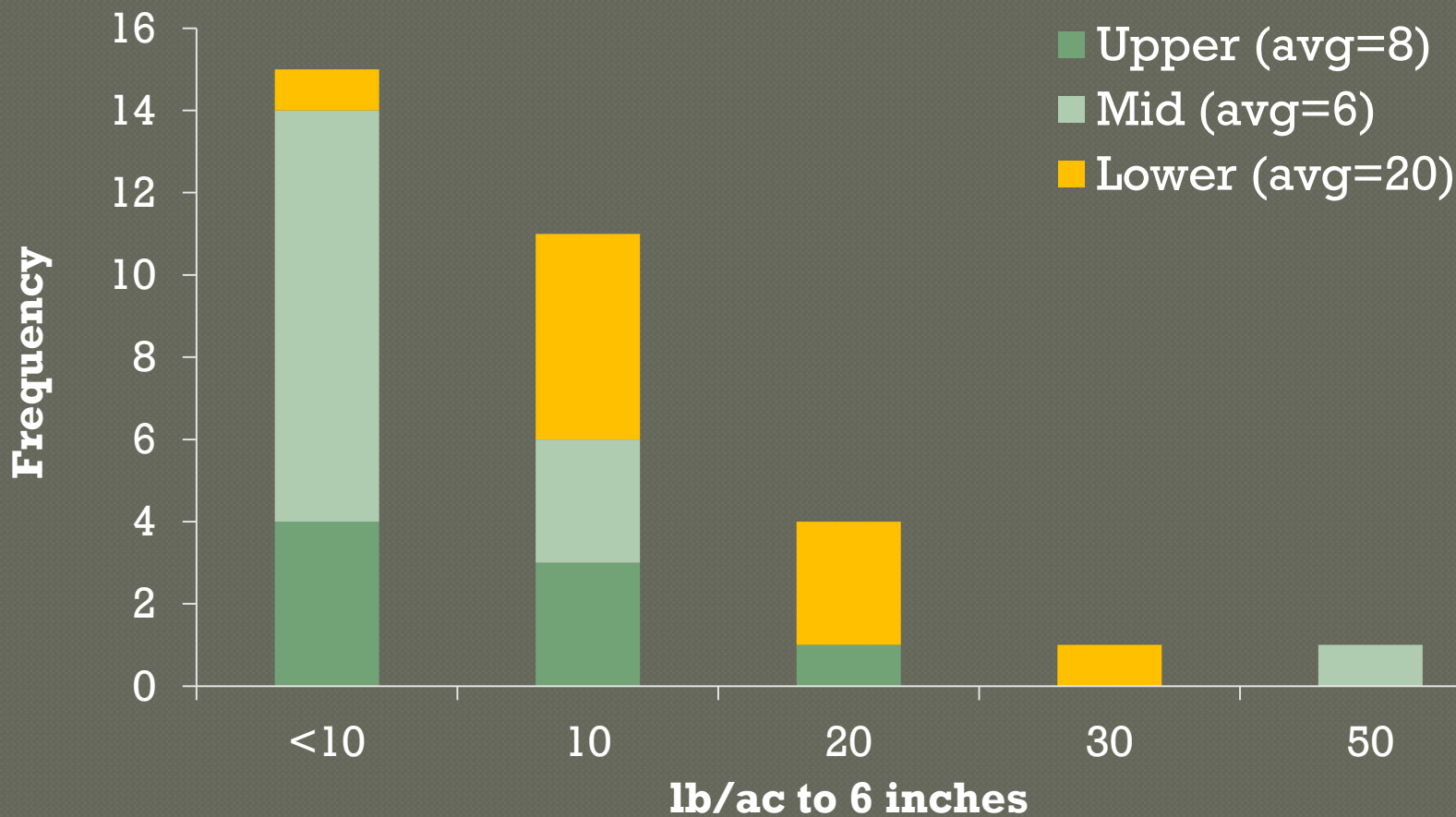
Soil-Forming Factors

- **Topography**
- Climate
- **Parent Material**
- Vegetation
- Time
- **Human Activity**

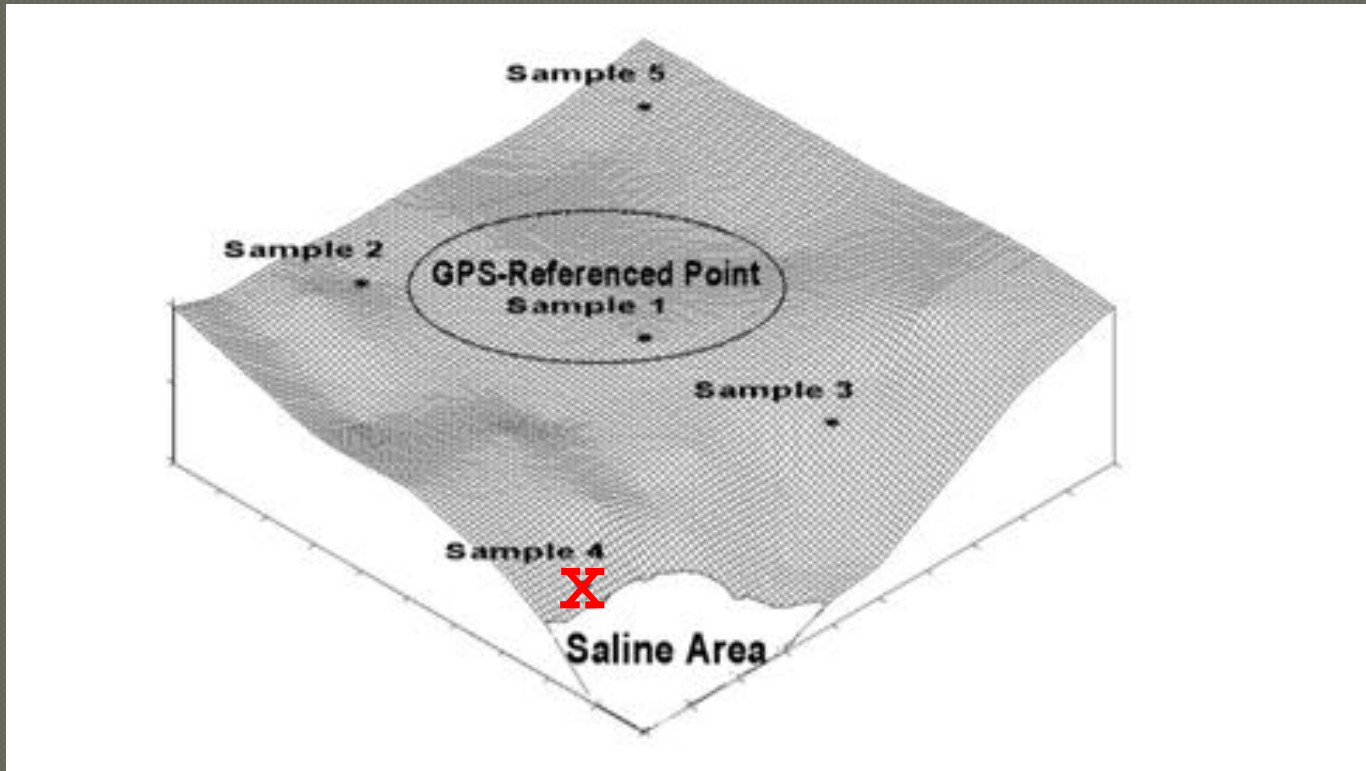
Soil Test P - Raymond



Soil Test S – Raymond (2010-11)

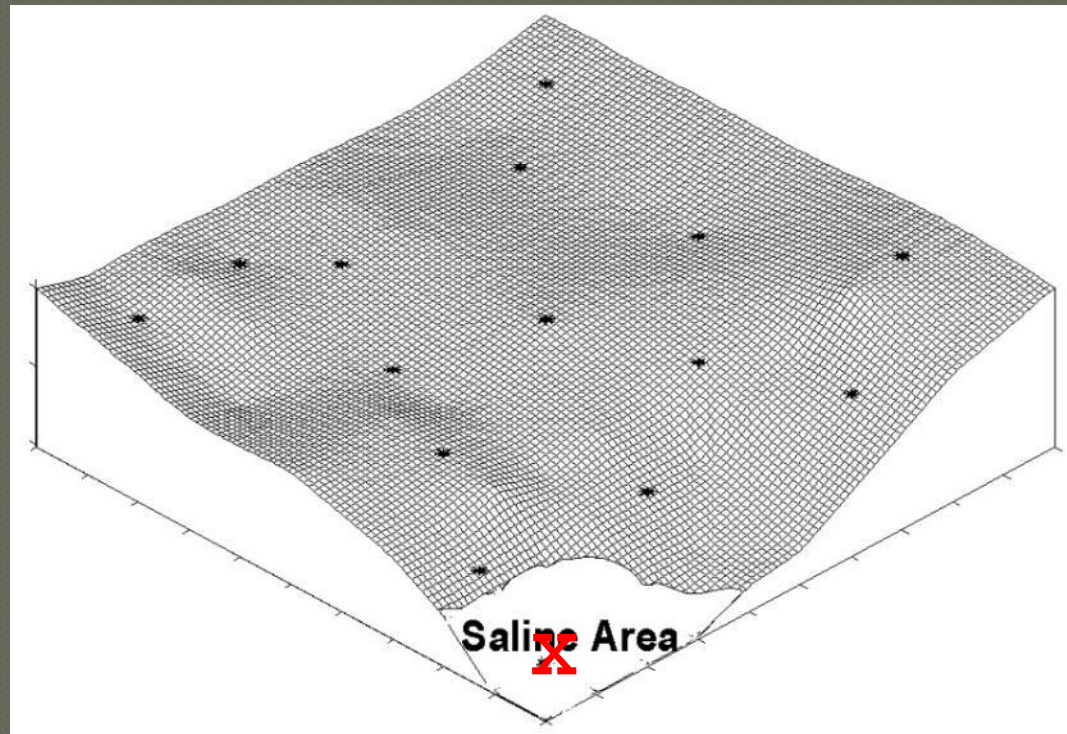


Benchmark Sampling



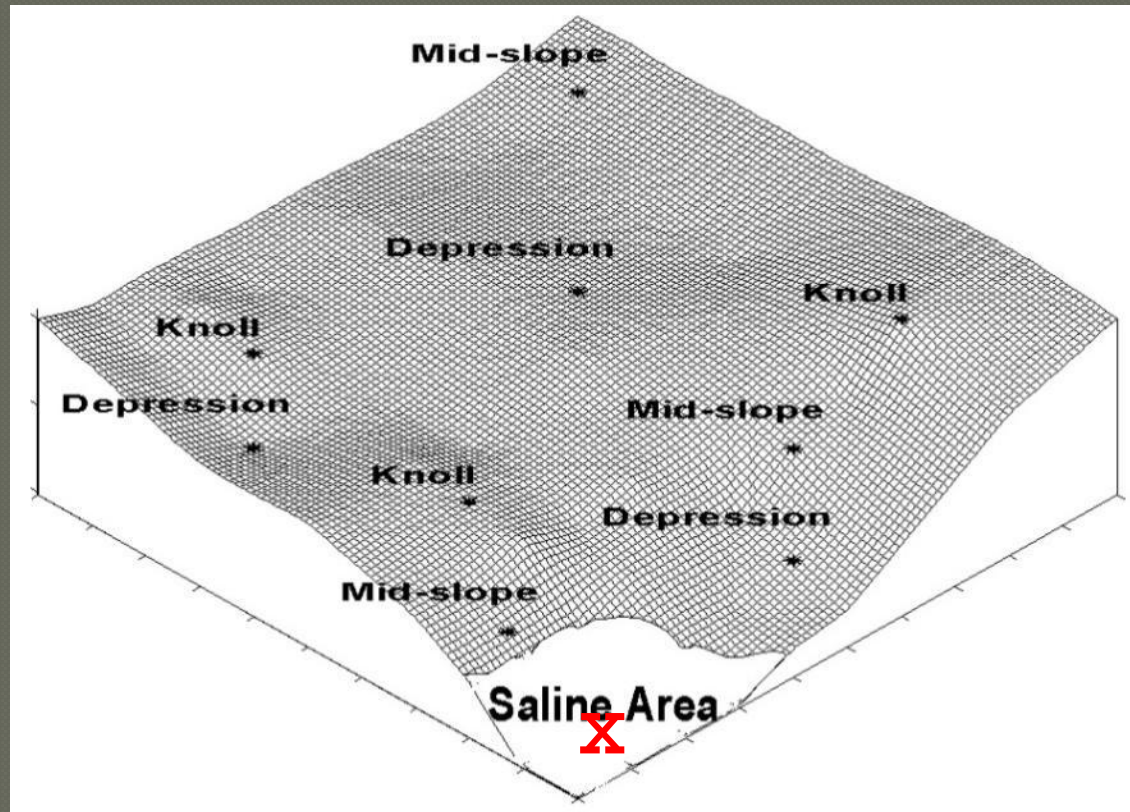
- 1 to 5 locations
- Geo-referenced
- Composite sample within each location

Random Sampling

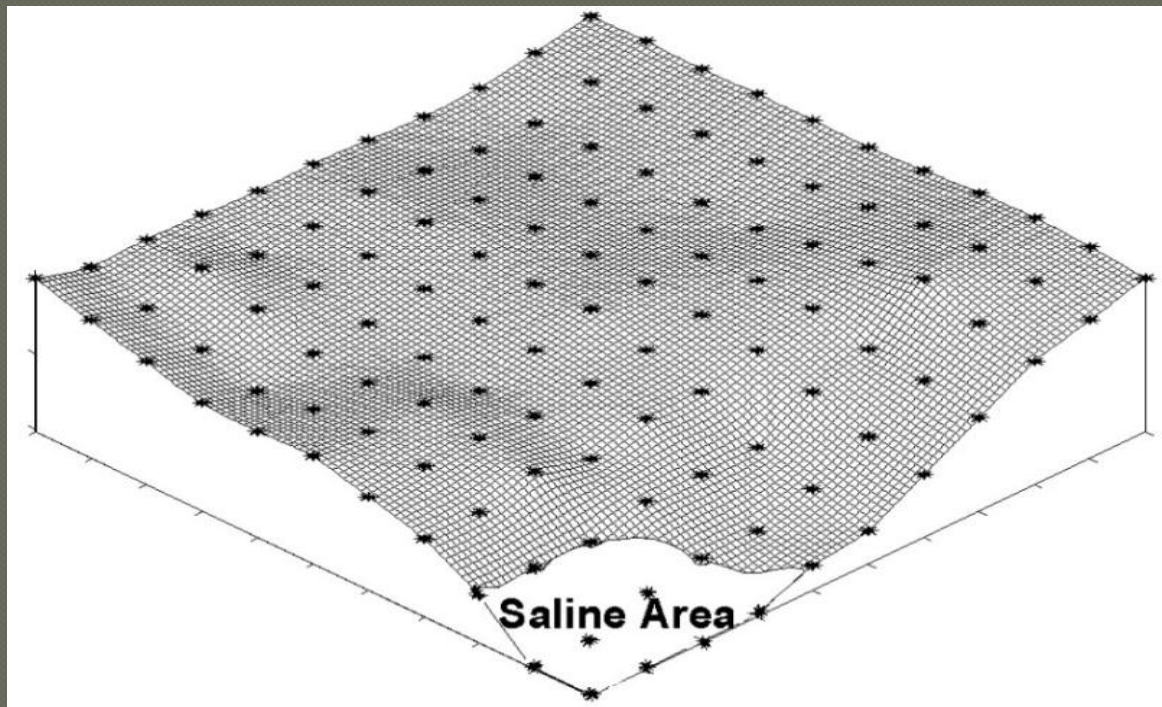


- 15 to 20 locations

Zone Benchmark Sampling



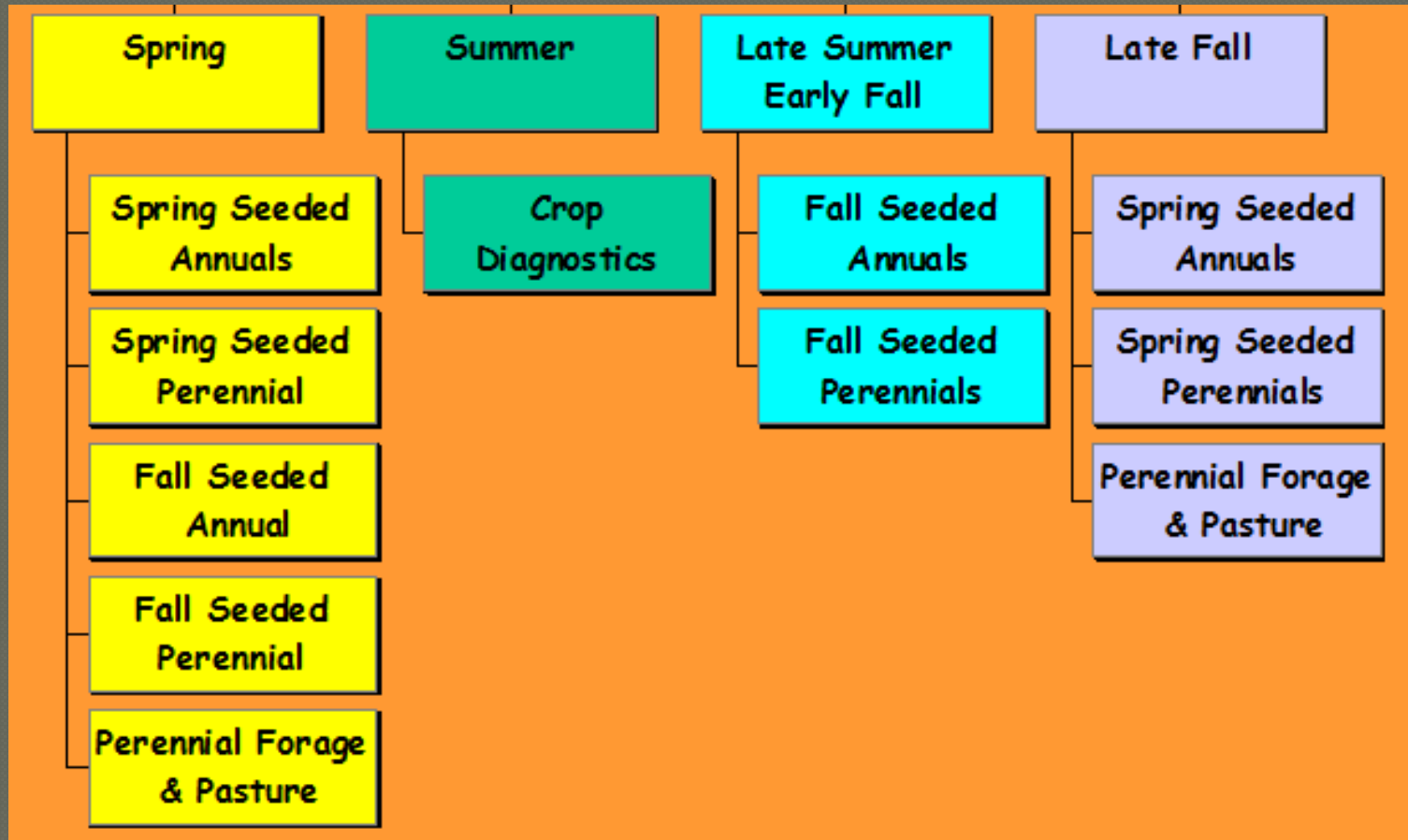
Grid Sampling



Sampling Locations

- Farmer knowledge
- Visual observation
 - Topography
 - Stubble condition
 - Salinity indicators
 - Topsoil depth
 - Soil texture
 - Field borders (current, past)
- Soil maps
(<https://soil.agric.gov.ab.ca/agrasidviewer/>)
- Imagery: Google Earth, satellite, yield maps

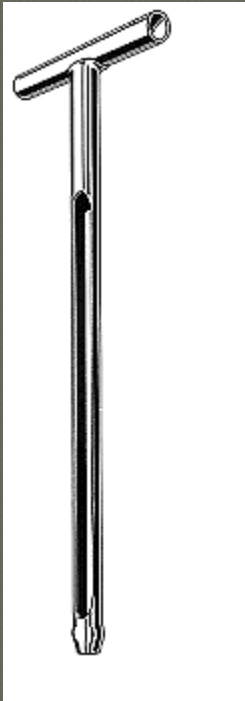
When to Sample



Surface Slice Sampling



Soil Corers - Manual



Oakfield probes

- Depth
- Diameter
- Backsaver
- Dry vs. wet soil tips



Dutch augur



Soil Corers – Truck-Mounted



20 years of
ALBERTA 1 CALL™
damage prevention





Soil Mixing



Soil Sample Handling

- Clearly label following lab guidelines
- Avoid warm and wet
- Deliver moist samples quickly or spread out for rapid drying

Final Outcome

A sample that is representative of the soil where most plants in a field obtain most of their nutrients

